53

Educational Research Bulletin

VOLUME XXVII
JANUARY TO DECEMBER, 1948

THE OHIO STATE UNIVERSITY
COLUMBUS • • • OHIO

R. H. ECKELBERRY, *Editor*
J. MACLATCHY, *Assistant Editor*

PUBLISHED MONTHLY, EXCEPT DURING JUNE, JULY, AND AUGUST, BY THE BUREAU OF EDUCATIONAL RESEARCH, OHIO STATE UNIVERSITY, FOR THE TEACHERS OF OHIO

EDUCATIONAL RESEARCH BULLETIN: ERB

370.78
O47
v.27

JANUARY 21, 1948

COLLEGE OF EDUCATION
THE OHIO STATE UNIVERSITY

Vol. XXVII, No. 1

EDUCATIONAL RESEARCH BULLETIN

(Entered in the United States Patent Office)

R. H. ECKELBERRY ..... *Editor*
J. MACLATCHY ..... *Assistant Editor*

PUBLISHED MONTHLY BY THE BUREAU OF EDUCATIONAL RESEARCH, OHIO STATE UNIVERSITY, FOR THE SCHOOLS OF OHIO. EDITORIAL AND BUSINESS OFFICES, ROOM 201, COLLEGE OF EDUCATION, COLUMBUS, OHIO

CONTENTS

World Understanding and Teacher Exchange 1
CHARLES H. WILSON, *Cincinnati Public Schools*

College Chemistry Students Deficient in Arithmetic: Academic Data 8
JOHN R. KINZER AND LYDIA G. KINZER, *Ohio State University*

A Formula for Predicting Readability 11
EDGAR DALE AND JEANNE S. CHALL, *Bureau of Educational Research*

Editorial Comment 21

Readings 22

BOOKS TO READ—*Administrative Planning for School Programs and Plants; American Government in Action; Foundations of Democracy; Education for Ladies, 1830–1860; Atomic Challenge; Our Teen-Age Boys and Girls; Minority Problems in the Public Schools; Unity and Difference in American Life; A History of Education.*

THE EDUCATIONAL RESEARCH BULLETIN is published monthly except during June, July, and August. Entered as Second-Class Matter, February 9, 1922, at the Post Office at Columbus, Ohio, under the Act of August 24, 1912. Accepted for mailing at specified rates of postage provided for in Section 1103; Act of October 3, 1917, authorized February 21, 1922.

Educational Research Bulletin

JANUARY 21, 1948
Vol. XXVII, No. 1

World Understanding and Teacher Exchange

By CHARLES H. WILSON

After a wartime lapse of five years, the exchange-teacher program between the United States and Great Britain is again under way. It is a heartening sign that no time has been lost in renewing this expedient for the promotion of understanding between these two English-speaking nations. As one of the last to participate in this program, from 1939 to 1940, I think it appropriate to evaluate exchanges in view of current demands.

During the past six years, vast numbers of American men and women have spent time in England. I have talked to many of them while I was an intelligence officer in the Army and since I have returned to civilian life. Their impressions of the English people, on the whole, have not been favorable. They say they do not like the English. They speak distastefully of English life and custom, and they disparage the English soldier. I have heard so much of this latter disparagement that I should be inclined to believe the Englishman as a soldier does not measure up to the Englishman as a civilian.

But reading letters from friends in England, most of whom were in the military service, leads me to believe that wartime contact failed to achieve more than military success. Generally, the comment from English ex-servicemen runs something like this: Sorry that the Americans were a bit of a disappointment. Your equipment was all right, but your men weren't much to speak about. We got tired taking positions, turning them over to the Americans, then having to retake them again. We didn't care much for them as individuals, either. Too conceited, boastful, uninformed. Perhaps we were expecting too much, old man.

COLORADO STATE COLLEGE OF EDUCATION
GREELEY, COLORADO

Now we are all aware that the official military reports of the United States and Great Britain contained little, if any, of such abuse. Furthermore, it is entirely possible that one individual's observation of criticism may not be representative. However, the variety of people with whom I have talked gives me the feeling that the spirit of antagonism is widespread. What are the reasons?

First of all, of course, is the natural dislike for places and persons connected with military service. We have all heard what "lousy holes" are Texas, Florida, Nebraska, California, Ohio, or wherever else troops were stationed. Then, too, there is the nostalgic reverence for all things "at home," and the tendency to compare unfavorably anything foreign. But deeper than that, I believe, is the positive inability of the people of one country to understand the people of another in the light of their heritage, environment, and language.

I have placed language last. Probably it is the first great impediment. Unfortunately, the two peoples do not speak the same language. Apropos, they do not even swear alike. I find that very few of our returning veterans are aware that the innoxious little English imprecation "bloody" is a deterioration of an old English term "By Our Lady," and is strictly taboo in respectable English circles. Conversely, if this were the legitimate stage and not an expurgated publication, it would be interesting to report how an Englishman can unwittingly shock an American's dignity, as the writer has had occasion to experience on numerous occasions. Most of us may be familiar by now with the English petrol (gasoline), wing (automobile fender), bonnet (hood), and dickey (rumble seat), but we are certainly less familiar with a ladder, a waistcoat, or a chucker-outer (in order, a run in a stocking, a man's vest, and a night-club bouncer). I recall how perplexed English school boys were with such words as *period*, to them a *full stop; quotation marks*, which they called *inverted commas;* or *diagramming*, for which they have a unique operation known as *boxing*. There were boys who actually failed to complete an *assignment* because I had given them no *homework*. But these examples of different words for commonly known items do not begin to scratch the surface of the misunderstandings which arise from mistaken connotation of commonly used words. According to Webster,

words are articulate sounds or series of sounds which symbolize and communicate an idea. "Uh-huh" or "Huh-uh" may communicate "yes" or "no" to an American, but I have yet to meet the "bloody" Englishman who can make sense out of either of these inelegant grunts.

No, when we talk to Englishmen, we are not really speaking the same language. But even with what confusing babble we use, we know so little of each other's habitat and customs that we can ordinarily go about as far as the weather, then stop, if we wish to remain on safe ground. Perhaps not that far. When an Englishman shivers and complains that there were two degrees of frost last night, he means "30° above zero" in our lingo. He does not know what American heat or American cold is like, even though he may brag a wee bit about his fog. His comparative judgments, however, are in no way as sharpened as an American's. An Englishman seldom knows the size or capacity of anything. Rare is the Englishman who can tell you how large is his home town, or approximately how many people an auditorium will hold. No one seems to know; no one seems to care. And it strikes him as odd that anyone should seek to find out. Should he be provoked to comment that he'll wager the big man walking down the street weighs nineteen stone ten, it sets an American translating to get a picture of a 276-pounder.

I believe I had driven home to me the significance of native habit when I asked the English masters at the King's School why it was that their schedules (which to them were *shed-ools*) were all jumbled; that is, why did they have mathematics the first period Monday, the fifth period Tuesday, maybe skip Wednesday, and have two periods Thursday, the third and eighth hours, and so on. They were puzzled. They wanted to know how else it was done. I explained the American system of having mathematics the first period daily throughout the week. They were still puzzled, and asked, "Don't you find it frightfully dull?" The environments in which the Englishman and the American live differ so greatly that it takes downright patience and perseverance for one to put up with the other.

THEN I mentioned the inability of peoples of one country to understand those of another in the light of their heritage. Perhaps I mean history. I have no intention of synthesizing myriads of good books on the history of both countries, but I

do call attention to the appalling ignorance of both peoples about each other's heritage. I doubt if one could point his finger more accusingly in one direction than the other; it would be like the pot calling the kettle black. Nor do I refer to the more obscure and technical points of history. I venture to say that the average Englishman, although he is vaguely familiar with the names, could not tell why Washington and Lincoln are honored in America, which one lived first, or approximately when either lived. The significance of 1492 and 1776 would leave him cold. But then, I wonder how many Americans might be tripped if they had to distinguish between 1066 and 1215.

Most informed persons, I believe, will agree that the greatest hindrance to international understanding and good will is the shocking failure of individuals to grasp the meaning of the phrase "brotherhood of man." There is this ever present judgment of an Englishman, an American, a Russian, and a Chinese, rather than Englishmen, Americans, Russians, and Chinese. We think of a foreigner as an individual possessing all the personality traits which we associate obscurely with his nationality. That is, we may think of an Englishman as an aged imperialist, a person absorbed in colonial interests, devoutly and blindly subservient to a king and queen. Perhaps we even think of him as wearing a Bertie Wooster monocle and a John Bull top hat. It is an interesting pastime, and perhaps a useful one for some people, to trace the admittedly prevalent similarities between national governments and individuals who compose the nation. But, on the whole, it is a ridiculous undertaking, and a dangerous one, when we attempt to draw conclusions. How many Americans, for instance, would consider themselves selfishly rich persons, seeking to dominate South Americans, and trying to run China for their own benefit? We think of ourselves as a variegated mass of individuals, seldom in agreement over anything, forever engaged in an endless number of interests, from political elections to societies for homeless canaries, with rarely a thought of international policy.

This is just as true of Englishmen. There are tall Englishmen and short ones, brilliant ones and stupid ones, the selfish and the benevolent, the refined and the coarse, the conceited and the modest, the materialist and the poet, the jingoist and the philosopher, with every combination and shade of in-between imaginable. For an American to say that he does not

like Englishmen, or vice versa, borders on incredible stupidity. What one means is that he knows practically nothing about the people whom he dislikes, unless he is a confirmed misanthrope, in which case he detests you and me, too, and does not deserve a moment's further consideration. But for some unfortunate reason, people continue listening to these expounders of prejudice and ignorance; and, as with the rumor whispered often enough, they soon have something resembling a well-grounded conviction.

I AM CONVINCED that the best way to know foreigners and to have foreigners know us is through the exchange-teacher and exchange-student programs. Of these two, I should far prefer the teacher exchange, unless students could be sent individually to foreign schools. Before entering upon my teaching duties in England, I attended Cambridge University, where there were about a dozen of us American students who formed a clique. We ate together, we had tea together, talked together, spent our vacations together, and together we "griped" about the English. Traveling throughout Europe, one constantly runs into bands of Americans learning foreign "culture" from "experienced" American guides. The gregarious nature of man is such that the minute he steps foot on foreign soil, the first thing he wants to do is locate a compatriot and talk things over.

As an exchange teacher, one gets beyond the superficial barriers. At first, he finds himself in a wilderness of strange custom. It is not pleasant. I dare say there are many persons who could not endure it. For the first month, I believed that I was one of those persons. I had lived in England for some time, enjoying myself in American company. Then I was left alone. And when I say *left alone* in England, I cannot put too much emphasis upon it. I introduced myself to the Headmaster of the school, hoping to find some welcome and companionship. He shook hands, not too cordially, I thought, told me when school opened, and said that he hoped I had found comfortable digs. I do not believe I exaggerate when I say that I was not introduced to a single member of the teaching staff. In the staff room, during the morning break, while the masters chatted sociably enough among themselves, I sat glumly looking out the window at sunless and depressing skies. All this, while my English exchangee was being fêted and honored back in America.

Toward the end of a month, while I conducted a continuous soliloquy of to remain or not to remain, people began to be more sociable. Of course, I had made acquaintances. But now they began inviting me to tea, to dinner, to spend an evening. They began asking questions about America, amazing questions, some of them: "Is it true every American boy and girl drives his own auto to school?" "Do you know Mr. Roosevelt?" implying, I suppose, did F. D. R. and I drop over to see one another on Sunday afternoons. And then there were the inevitable boys' requests to tell about the Indians, cowboys, and gangsters. Once the Englishmen found that the visitor did not carry concealed tomahawks and shotguns, that he had not come to sell a bill of goods about America, that, after all, he was just another person like them, they commenced a deluge of invitations which it soon became impossible to accept. For Christmas that first year, I had more than twenty invitations to dinner. I was asked to go on hunting and camping trips and on all sorts of holiday tours. It was embarrassing to have to refuse so many kind offers.

The interests people had were quite as varied as one would find in his home country: one family enjoyed bridge, another skittles; with one group of friends you attended the symphony concerts, with another, dance halls; some people never got further than politics and the stock market in their conversation, while others stuck exclusively to the humanities. They abhorred each other's tastes quite as fervidly as do Americans. Some were sure that England was rapidly approaching the nadir of decadence, and others were equally certain that England was the hope of mankind and on the brink of a great and prosperous future. About the only points of unanimity among them were the universal recognition that the weather was abominable, and the general feeling that England was, when all cards were down, quite the best country the world has ever known. There was the widespread notion that all the peoples of the world looked to England for hope, assistance, and democratic precedence. In fact, it was not at all difficult to imagine onself right at home.

THE exchange teacher has the opportunity that rarely befalls the tourist, the traveling guest, or the diplomatic representative. He lives and works with foreigners, and he seldom sees a fellow American. However hard he fights against

it, he picks up the English accent, English words, English customs, and English ways of thinking. One need not worry about that. He drops them readily when he returns to native soil. What he can never lose, though, is an appreciation of the fundamental fact that there is no such thing as a "foreigner," an oddity which lives in some other country. He comes to know, in ways that other visitors rarely experience, that Englishmen are neither saints nor devils, but plain, struggling, diversified people, not the least unlike all the neighbors one has known his entire life.

Furthermore, the teacher has the opportunity to share his experiences and knowledge with those who will most profit from them. The range of lives which he touches is, as a rule, vastly greater than that of the exchange student or the traveler. For this reason, I believe that it is regrettable that there is not more emphasis placed upon teacher exchange. Under the present plan, the burden of expense is placed largely upon the teacher; not only that, but the initiative for undertaking the exchange must come chiefly from the teacher as well. It seems to me that there should be more encouragement from administrators, school boards, and college trustees, for teachers to take advantage of any exchange opportunity. Moreover, it seems not too much to desire that greater governmental co-operation ought to be forthcoming to facilitate transportation and to ease the financial strain created by travel and incidental expenses.

It is a good omen that teacher exchanges are again being arranged. I believe firmly that they are essential in the tremendous task of fostering international understanding and peace. In spite of the existing difficulties and costs, it is to be hoped that schools everywhere throughout the English-speaking world will encourage teachers to participate in the exchange programs.

College Chemistry Students Deficient In Arithmetic: Academic Data

By JOHN R. KINZER AND LYDIA G. KINZER

EACH quarter at Ohio State University, remedial instruction in arithmetic is given to college Freshmen enrolled in the first course in chemistry. For several years an examination in the fundamentals of arithmetic has been an important factor in the placement of chemistry students. On a percentage basis the scores on the arithmetic test for each quarter present certain constants: about one-third of the students examined each quarter can solve fewer than one-third of the problems given in the placement test. These students are notified of the deficiency. Each quarter approximately half of those notified actually appear for help, although remedial classes have been arranged for persons needing help in arithmetic. A general description of this remedial program and some data about the number of students found deficient each quarter appeared in an article in May, 1946, in the EDUCATIONAL RESEARCH BULLETIN.[1] In this study, 120 students deficient in arithmetic, for whom complete data were available and who had entered Ohio State during the Autumn Quarter, 1945, are described. This report presents some academic data which show the kind of college work these students did and some intercorrelations between certain variables of the group.

The Ohio State Psychological Examination is given to all new students during Freshman Week. This examination is considered one of the best single predictors of academic success. The distribution of the percentile scores of these 120 students on the Ohio State Psychological Examination was:

Percentile Scores	Number of Students	Percentile Scores	Number of Students
0–10	12	51–60	9
11–20	10	61–70	16
21–30	16	71–80	8
31–40	19	81–90	14
41–50	13	91–100	3

This distribution varies only slightly from normal. The mean percentile score is 50.6.

The majority (62) of the 120 students in this group entered

[1] Kinzer, John R., and Fawcett, Harold P. "The Arithmetic Deficiency of College Chemistry Students," EDUCATIONAL RESEARCH BULLETIN, XXV (May 8, 1946), pp.113–14.

college immediately after graduating from high school. The years between high school and college for the others were distributed as follows:

Years Out of High School	Number of Students	Years Out of High School	Number of Students
1	12	6	3
2	5	7	6
3	10	8	4
4	5	9	4
5	5	10, 12, 13, 14 (one each)	4

These students took the first course in chemistry concurrently with the remedial-arithmetic sessions. The distribution of final chemistry marks of the 120 students was:

	Number of Students
A	5
B	22
C	49
D	29
E	15

This distribution is approximately normal. The average chemistry mark for this group was 1.78, which is slightly less than a *C*—in computing the point-hour ratio, *C* is given a numerical equivalent of 2. The criterion of success with this group of students was the final chemistry mark. Eighty-three students in the remedial group of 120 persons had had high-school chemistry. One would assume that this preparation should have contributed to proficiency in college chemistry. However, it is strange that they should have done so poorly in arithmetic if the high-school chemistry was functional.

The average point-hour ratio of each of these students for the quarter in which they took the remedial instruction in arithmetic was computed. The numerical equivalents used in computing the point-hour ratio at Ohio State are: *A*, 4; *B*, 3; *C*, 2; *D*, 1; and *E*, 0. The distribution of the point-hour ratios of the students was:

Point-Hour Ratio	Number of Students	Point-Hour Ratio	Number of Students
0– .49	1	2.0 –2.49	41
.50– .99	3	2.5 –2.99	22
1.0 –1.49	13	3.0 –3.49	11
1.5 –1.99	22	3.5 –3.99	5

The average point-hour ratio of the 120 Freshmen in all subjects for the Autumn Quarter, 1945, was 2.33.

A check of the student directory for the Autumn Quarter, 1947, two years later, revealed that 71 of the 120 students

were still in the University. Of the 5 students who received a mark of *A* in the first chemistry course, 3 were still in college; 17, of the 22 who were marked *B*; 31, of the 49 who were marked *C*; 15, of the 29 who were marked *D*; and 5, of the 15 who were marked *E*.

There seems to be evidence that many of these students who appeared for help in arithmetic are quite capable of college work. Their Ohio State Psychological Examination scores deviate slightly from the usual range and so does a distribution of their marks. The 71 students who are still in the University certainly have proved themselves worthy of attention.

TABLE I

CORRELATIONS OF THE SCORES MADE BY THE STUDENTS ON VARIOUS MEASURES WHICH ARE THOUGHT TO HAVE PREDICTIVE VALUE

	Chemistry Mark	O.S.P.E.	Reading Test	Point-Hour Ratio*	Problems Attempted†	Arithmetic Placement Test	
						Scores on First Test	Scores on Retest
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Chemistry mark	.....	.54	.52	.78	—.02	.16	.52
Ohio State Psychological Examination .	.54	.....	.85	.59	—.02	.19	.32
Reading test	.52	.85	.....	.60	—.07	.16	.28
Point-hour ratio (Autumn, 1945)	.78	.59	.60	.....	.01	.18	.37
Number of problems attempted on arithmetic placement test	—.02	—.02	—.07	.01	.....	.45	.27
Score on arithmetic placement test ...	.16	.19	.16	.18	.45	.....	.28
Score on arithmetic retest	.52	.32	.28	.37	.27	.28	.....
Other measures of each distribution:							
Mean	1.78	50.6	52.4	2.33	7.66	23.20	65.6
Standard deviation	1.02	26.0	25.6	0.71	2.54	11.53	20.6

* For the Autumn Quarter, 1945.

† This column shows the correlations between the number of problems attempted on the first Arithmetic Placement Test. There are 15 problems in the test.

THE students considered in this study made scores on the first arithmetic placement test which fell in the lowest one-third of the distribution. The average score of these students on the test of 15 problems was 23.2. After three weeks'

[*Continued on page 27*]

A Formula for Predicting Readability

By EDGAR DALE AND JEANNE S. CHALL

SEVERAL months ago the editor of the *Wall Street Journal* ran a full-page advertisement in one of the leading literary magazines, announcing two honors recently awarded to it. One of these honors was a statement made by Robert P. Gunning that the *Wall Street Journal* had "the most readable front page in the country."

How did Mr. Gunning come to this conclusion? Did he actually sample a cross section of the readers, have them read the front pages of leading newspapers, and then compare their ability to read and understand the various front pages? No. He used an accepted short cut. He predicted the reading difficulty of the various front pages by using a readability formula and found that the *Wall Street Journal* was the "most readable."

This recognition by leading journalists that readability is an important selling point for their newspapers is an event that is still quite new on the publishing horizon. Although some objective techniques for measuring readability have been known for at least twenty-five years, they have been neatly buried in educational and psychological journals, doctoral dissertations, Masters' theses, and the like. If the techniques were used at all, they were confined to children's textbooks. What has taken the dust off the technical journals and made readability a household word in the writing and publishing field?

As in the rise in popularity of any technique, there was a critical need for this one. The war period made us realize more than ever the importance of reaching large audiences. More people had to fill out tax forms; more people had to be appealed to to buy war bonds; more people had to co-operate in numerous activities to help win the war. Because a larger audience had to be reached, the writers had to use a style that could be understood by more persons than the usual book readers. They could no longer afford to hit or miss with printed materials.

ALONG with the growing need for more scientific means of verbal communication, there was a growing fund of practical objective measurement of readability. The Lorge formula

was one of the first easy-to-apply readability formulas.[1] By the use of this formula we could predict in a fairly short time how difficult a piece of written material was to read and understand. It was no longer necessary to guess. By counting the relative number of different uncommon words, the average sentence length, and the relative number of prepositional phrases, we could get a good index of readability in terms of grade scores.

In 1943 Rudolf Flesch produced his readability formula.[2] He presented a very convincing argument for the superiority of his formula over the previous ones, especially for use with materials for adult readers. With numerous correlation tables he showed that the Lorge formula, in its use of the Dale List of 769 Easy Words as a measure of vocabulary difficulty, failed to discriminate satisfactorily between materials that were above the eighth-grade level in difficulty. Since the average adult has approximately eighth- or ninth-grade reading ability, he thought that another technique was needed to predict the readability of materials for adult readers. In his formula, Mr. Flesch used three factors: average sentence length, relative number of affixed morphemes (prefixes, suffixes, inflectional endings), and relative number of personal references.

WHEN the Flesch formula was first released, we were evaluating the educational materials published by the National Tuberculosis Association. It was our job to analyze the pamphlets already published and to find ways of writing them so that they could be understood by the average adult. We used the Flesch formula to help us evaluate the reading difficulty of the pamphlets.

On the whole, we found the formula adequate. However, we also found some shortcomings. The most serious shortcoming was the count of affixes, which we found to be rather arbitrary, in the sense that two people making a count on the same sample would usually come out with a different number of affixes. If we were extremely careful and consulted a dictionary to be certain that all affixes were included and that no non-affixes were included, we found that the work was too time-consuming.

Mr. Flesch's reasons for using affixes as a count of difficulty

[1] Lorge, Irving. "Predicting Reading Difficulty of Selections for Children," *Elementary English Review*, XVI (October, 1939), pp. 229–33, *and* "Predicting Readability," *Teachers College Record*, XL (March, 1944), pp. 404–19.

[2] Flesch, Rudolf. *Marks of Readable Style*. New York: Teachers College, Columbia University, 1943. (Teachers College, Columbia University, Contributions to Education, No. 897).

are very well stated, with statistical evidence, in both his books.[3] His logic was that word recognition, although an important factor in reading for beginning or poor readers, is of practically no importance for more mature readers. For the better readers, it is the relationship between the words and abstractness of the words that contribute to difficulty. He actually computed the affixes (as a measure of verbal relationship) and the abstract words contained in five levels of magazines and found that both of these factors were a good measure of difficulty. He dropped the count of abstract words in his formula because the magazine experiment "had shown that the count of affixes was a practically equivalent measure of abstractness ($r = .7849$), and the latter method was far less cumbersome."[4] In fact, in another section of his book, he refers to the count of affixes as "a simple short cut to the count of abstractions."[5]

If Mr. Flesch used a correlation of .7849 to justify his calling the affixes a "simple short cut to the count of abstractions," could we not also call the Dale List of 769 Easy Words a short cut to the count of abstractions, since Mr. Lorge found a high correlation between affixed morphemes and words outside this list? Or could we not argue that Mr. Flesch's count of affixes is just another way of counting hard words?

In his article, "Predicting Readability," Mr. Lorge makes the following statement about measuring vocabulary load:

> It should be recognized that such elements as the number of abstract words, the number of uncommon words, the number of polysyllabic words, and the weighted index of difficulty of vocabulary are all intercorrelated. Any one of them could be used in place of any other, provided suitable adjustment were made in the empirical formula.[6]

If all counts of vocabulary load, whether abstract words, affixed morphemes, or number of uncommon words, are interrelated, why use a less exact and more cumbersome method when a simpler one can be used?

From the evidence given, we believed that there was value in using a word list to measure vocabulary load. Mr. Flesch's main objection to the use of the Dale list of 769 words was that it did not differentiate between the higher levels of difficulty. What would happen if a larger word list were used?

[3] Flesch, *op. cit.* and *The Art of Plain Talk* (New York: Harper and Brothers, 1946).
[4] Flesch, *Marks of Readable Style*, p. 32.
[5] *Ibid.*, p. 24.
[6] Lorge, *loc. cit.*, p. 406.

Such a list would not be a discriminating instrument at the easy levels of writing since it would contain words not known to some of the readers. But by using a list which included most of the words well known to fourth-grade readers, a more discriminating instrument would be devised for the upper levels of reading ability.

The second shortcoming of the Flesch formula was the count of personal references. In our numerous analyses we found that the personal-reference count was not a reliable index of difficulty. For example, when we speak of *John* and *Mary* and *he* and *she*, referring to John and Mary, there is a justification for subtracting from difficulty. This is because in writing about John and Mary we usually say things that are not abstract or general. However, subtracting from difficulty for personal references such as *R. J. Thomas* of the automobile industry, or *Senator Austin,* when we are writing about atomic energy or the United Nations, does seem to us a bit inaccurate. If the reader does not know these persons, the difficulty of the written material is not decreased. In fact, these individuals are no longer personal, they are abstractions. Flooding printed materials with personal references to these "abstract" persons will add little to "human interest" and ease of comprehension.

A recent article in the *American Psychologist* by S. S. Stevens and Geraldine Stone reported that Koffka's *Principles of Gestalt Psychology* had a predicated Flesch score much lower than had been expected. In fact, it came out only a little higher than the elementary textbooks in psychology. It was startling news for them. They wrote:

> The Harvard graduate students don't believe it, because they read Koffka and sweat.
>
> . . . Now how can Koffka, the students' choice for unreadability, score so low? . . . Opinion around Harvard seems divided on this question, but this opinion is based on mere casual introspection, not on the result of careful analysis. A few things appear evident, however. For one thing, Koffka helps his score by peppering his passages with personal pronouns: 5.8 per hundred words. But his "I," "we," and "you" are rhetorical devices—he is actually very rarely talking about us or about himself. He is talking about abstractions and complicated relations and *he* and *we* get into it as mere guinea pigs in an experiment.[7]

Here is the sample they quote from Koffka:

> In the first cases, real moving objects present in the field, the shift of

[7] *American Psychologist,* II (July, 1947), p. 233.

the retinal pattern leads to behavioral motion of objects, whether I fixate a non-moving object or follow a moving one with my regard; in the second case, when my eyes roam over stationary objects, such a shift will *not* have this result. Although the two facts belong closely together, the second one will be fully discussed in Chapter IX, after we have introduced the ego. Here we concentrate mainly on the first, even if we cannot entirely avoid referring to the second. Thus we turn now to the theory of perceived motion.[8]

This passage has 7 personal references per hundred words. According to Flesch's Quick Reference Chart,[9] a similar number of personal references characterizes materials that in difficulty are standard and are comparable to digest magazines.

In view of the shortcomings of the Flesch counts of affixes and personal references, we undertook to find a more efficient means of predicting readability. Our hypotheses were:

First, a larger word list would predict as well as, if not better than, the count of affixes. It would avoid the pitfalls of lack of discrimination at the upper levels of difficulty.

Second, a count of personal references does not add very much to the prediction of readability.

Third, a shorter, more efficient formula could be evolved with the use of a word factor and a factor of sentence structure.

For our sample passages, we used the McCall-Crabbs *Standard Test Lessons in Reading*,[10] the same passages used by Mr. Lorge and Mr. Flesch. These are a series of 376 passages of children's readings, already graded in difficulty on the basis of comprehensibility of questions at the end of each passage. This material, it should be noted, has serious deficiencies as a criterion, but it is the best we have at the present time. The writers, however, checked their findings against other passages as noted later. Following these authors, our criterion was the grade-level score equivalent for a group of readers who would get half of the test questions right on each passage. Mr. Lorge made his data sheets available to us.[11] These data sheets also included the Flesch counts of affixed morphemes and personal references.

[8] Koffka, K., *Principles of Gestalt Psychology*. New York: Harcourt, Brace and Company, 1935. p. 280.

[9] Flesch, *The Art of Plain Talk*, p. 205.

[10] McCall, W. A., and Crabbs, Lelah. New York: Bureau of Publications, Teachers College, Columbia University, 1926.

[11] The authors wish to thank Mr. Lorge for making the data sheets available and for permission to publish the intercorrelations of his factors.

Our word count was based on the Dale list of approximately three thousand words. This list was constructed several years ago by testing fourth-graders on their knowledge in reading of a list of approximately ten thousand words. This larger list included the most common words in the Thorndike,[12] Buckingham and Dolch,[13] and other word lists. Words such as *milkman, carrot, candlestick, catbird,* and so on, which appeared in the high thousands on the Thorndike list, were also tested with fourth-graders to see whether they knew them. An attempt was made to include all words that fourth-graders would possibly know. A word was considered as known when at least 80 per cent of the fourth-graders checked it as known.

This list differs from the Thorndike word lists in that it is a measure of familiarity in reading rather than a measure of frequency of appearance in printed materials. Words such as *bracelet, watermelon,* and *cabbage,* appearing in the high thousands in the Thorndike lists, are included in the Dale three thousand list. In that respect it is less artificial than the Thorndike lists. No claim is made that all the words actually known in reading by at least 80 per cent of fourth-graders are on this list. Some may have been left out. The testing method used is crude. But it does present a fairly complete list of familiar and simple words.

We went through the 376 passages in Books II to V of the McCall-Crabbs test lessons. In each passage, we counted the relative number of words not on the Dale list of 3,000 words.[14]

We punched this information on Hollerith cards, along with the information made available by Mr. Lorge. The intercorrelations appear in Table I.[15]

From Table I the reader can see that the highest correlation with the criterion is the relative number of words outside the Dale list of 3,000 words. The correlation is .6833. The

[12] Thorndike, Edward L. *A Teacher's Word Book of Twenty Thousand Words.* New York: Teachers College, Columbia University, 1931.

[13] Buckingham, B.R., and Dolch, E.W. *A Combined Word List.* Boston: Ginn and Company, 1936.

[14] The specific instructions for counting will be included in the instructions which will appear in next month's issue.

[15] We wish to thank Mr. Flesch for permission to use his factors and to publish the intercorrelations of his factors, and Harold A. Edgerton for invaluable statistical help.

TABLE I

INTERCORRELATIONS BETWEEN FOUR STYLE ELEMENTS AND GRADE SCORE OF A PUPIL WHO ANSWERED ONE-HALF THE QUESTIONS ON MCCALL AND CRABBS

	Dale Score (3,000 List)	Flesch Affixed Morphemes	Flesch Personal References	Lorge Hard Words (Dale-769)	Criterion C_{80}	Mean	Standard Deviation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Average sentence length	.5108	.4428	—.2201	.4913	.4681*	16.8037	5.3813
Dale score (words outside 3,000 list)	.....	.7932	—.4033	.7988	.6833	8.1011	6.3056
Flesch affixed morphemes†	.....	.....	—.3254	.7441	.6017	25.2819	11.0668
Flesch personal references†	.....	.....	.....	—.3422	—.3675	7.8245	5.5439
Lorge hard words (outside Dale 769 list)	.....	.....	.....	.....	.6148	17.4165	7.1659
Criterion (C_{80})	.....	.....	.....	.....	.....	5.7492	1.6565

* The correlation coefficient reported here between the average sentence length and the criterion is much lower than the one reported by Mr. Lorge and later by Mr. Flesch. They reported a correlation coefficient of .6174. We checked this with Mr. Lorge. He went over his data and found that an error had been made in the computation. He is publishing the correction in an article which will appear in *School and Society*, February 21, 1948.

† The intercorrelations of the two Flesch factors here reported are slightly different from those presented by Flesch in *Marks of Readable Style*. These differences are not significant and were probably caused by our using gross scores on Hollerith cards while Flesch used grouped data for his correlations.

two next highest factors are the Lorge hard-word count (based on the Dale list of 769 words) and the Flesch affixed-morphemes count. The intercorrelations among these three factors are high; between the Dale score and the Flesch morphemes, .7932; between the Flesch morphemes and the Lorge hard-word count, .7441; and between the Dale score and the Lorge hard-word count, .7988. This table corroborates Mr. Lorge's findings that a measure of vocabulary load is the most important factor in reading difficulty, and that all the measures of vocabulary are highly intercorrelated.

The next highest measure of difficulty is average sentence length—which correlates .4681 with the criterion.

After making several combinations of factors, we found that the following two, plus a constant, gave the most efficient empirical formula:

$$X_{c_{50}} = .1579X_1 + .0496X_2 + 3.6365$$

When $X_{c_{50}}$ = reading-grade score of a pupil who could answer one-half of the test questions correctly

X_1 = Dale score (relative number of words outside Dale list of 3000 words)

X_2 = average sentence length

3.6365 = constant

The multiple-correlation coefficient of these two factors with the criterion is .70. Adding the factor of human interest (personal reference) of Mr. Flesch raises the multiple-correlation coefficient to .7025, an insignificant increase.

Because of the correction in the sentence-length factor, we recomputed the multiple-correlation coefficients on the Lorge and Flesch formulas. The corrected Lorge formula has a multiple correlation of .66. The corrected Flesch formula also has a multiple correlation of .66. We see that the one factor, words outside the Dale list of 3,000 words, alone, has a greater prediction than the three-factor Flesch and Lorge formulas.

Does this new two-factor formula work in predicting the difficulty of reading materials other than the McCall-Crabbs reading passages? We conducted several experiments comparing the formula predictions with the judgments of experienced teachers, the judgments of readability "experts," and the actual comprehension scores of readers on passages.

On fifty-five passages of health-education materials, we found that our two-factor formula predictions correlated .92 with the judgments of readability experts, and .90 wih the reading grades of children and adults who were able to answer at least three questions out of four on thirty of these passages. They ranged from the extremely easy to the very difficult.

On 78 passages on foreign affairs from current-events magazines, government pamphlets, and newspapers, the correlation between the predictions of the formula and judgments of difficulty by expert teachers in the social studies was .90.

As a result of these various experiments, we set up the following table of estimated corrected grade levels:

Formula Score	Corrected Grade Levels
4.9 and below	Grade IV and below
5.0 to 5.9	Grades V-VI
6.0 to 6.9	Grades VII-VIII
7.0 to 7.9	Grades IX-X
8.0 to 8.9	Grades XI-XII
9.0 to 9.9	Grades XIII-XV (college)
10.0 and above	Grade XVI+ (college graduate)

The formula developed by the writers is a simple, two-factor formula that is easy to apply. With the use of a factor of vocabulary load (relative number of words outside the Dale list of 3,000 words) and a factor of sentence structure (average sentence length), we have a good prediction of readability. The additional validation on health and social-studies materials shows that it compares favorably with judgments of experts and with actual reader comprehension.

The corrected grade levels help interpret the scores obtained by the formula and give a more usable means of placing materials within the comprehension of the various grades. For example, a given piece of material having a formula score of 5.2 (corrected grade level of Grades V-VI) should be within the comprehension of children who have fifth- to sixth-grade reading abilities. By this we mean that these children will be able to answer approximately one-half to three-fourths of the questions asked on the material, concerning specific details, general import, appreciation, knowledge of vocabulary, and so on.

For adults, the corrected grade levels may be interpreted to mean the number of years of schooling required to read the material with ease and understanding. For example, if an article or book has a formula score of 6.3 (corrected grade level of Grades VII-VIII), it should be within the comprehension of the average adult who has had about eight and one-half years of schooling.

We do not claim that the formula developed here is definitive. The nature of the multiple-correlation coefficient makes this point rather obvious. We do believe, however, that it is a short cut in judging the difficulty of written materials.

The formula can also be used as an aid to text simplification. When a text has an undesirably high score according to the prediction of the formula, it may be simplified by substituting more concrete, familiar words for the unfamiliar and abstract words. Perhaps sentences can be shortened and made clearer. Writing should not be any harder to read and understand than it needs to be. Some writing, however, is hard to understand because the ideas are hard and complicated. It may be impossible to simplify this type of writing. On the other hand, a good deal of writing is hard because the words used are unnecessarily abstract and the sentence and paragraph structure needlessly complex. A later article will discuss these problems.

But we must be cautious about "writing for a readability formula." We must remember at all times that a formula is a statistical device. It means that, on the whole, longer sentences make comprehension more difficult. This does not mean that all long sentences are hard to read and understand. There are some very short sentences that may be harder to comprehend than longer ones. The same holds true for the use of familiar words. On the whole, the more unfamiliar the words used, the harder the material will be to understand. But sometimes familiar words are used in a symbolic or metaphoric sense. "To be or not to be" is not an easy idea although the sentence is short and the separate words used would usually be called simple and familiar ones. Readability formulas are not sensitive to such subtle variations in meaning.

Furthermore, the nature of the difficulty of a given piece of writing depends to a great extent upon what we expect a reader to get out of the material. If we ask difficult questions on a passage, even if the passage is fairly simple, the reader may not be able to answer the questions asked and therefore will not understand it by our set criterion.

The reader's purpose in reading and his interest and background in the subject-matter must also be considered by anyone using a readability formula. To say that a given article on chemistry is comfortable reading for average adults because it has a predicted grade level of VII-VIII, is giving an incomplete picture. For those readers who have no interest or no background in chemistry, the article will probably not be comfortable reading and they may get very little meaning from it. For other readers who are interested in chemistry and do considerable reading in the subject, the same article will probably be most comfortable reading. This difference in ease of reading and comprehension may exist even though both groups of readers have completed approximately eight and one-half years of schooling and have the same general reading ability on a standardized reading test.

Taking account of differences in background is especially important in writing and selecting materials for persons who have a specialized understanding of a field. Thus, in material written for farmers, the inclusion of such words as *barley, flax, hybrid, husk, fertilizer, mulch* will increase the predicted grade

[*Continued on page 28*]

EDITORIAL COMMENT

A Promising Project

THE recently published Commission on Life Adjustment Education for Youth has the opportunity of making a major contribution to the development of American secondary education. It has been set up for a three-year period to develop plans for revising the high-school curriculum so as to make it serve better the needs of all American youth, especially those who do not plan to go to college or to prepare themselves for jobs in trades and industries.

During the three decades since the Commission on the Reorganization of Secondary Education issued its epoch-making report, *Cardinal Principles of Secondary Education*, a great deal has been accomplished in making the high-school curriculum serve better the needs of its clientèle. But a great deal remains to be done. Notwithstanding the efforts of commissions, committees, and individual educators too numerous to mention, it is still true that the curriculum of the average high school is largely based on the needs and interests of two groups of students: first, the comparative few who expect to go to college or who, at least, have strong academic interests; and second, those who are taking vocational courses. Everyone knows that, at least in the educationally more advanced areas of the country, the student body of the high school has come to include nearly all members of the teen-age generation except those requiring institutional or other specialized treatment. Everyone gives lip service to the principle that the curriculum should be planned to meet the needs of all students. But in practice, there still is a great deal of similarity between the typical high-school curriculum of today and that of 1890, when the high school enrolled but a small fraction of the adolescent generation. Broadly speaking, we have not made a serious and sustained effort to discover and provide those school experiences which would be most effective in developing the best possible persons, citizens, and parents.

It is to this task that the Commission is to devote its efforts. It will not, of course, attempt to dictate policies to the schools.

[*Continued on page 28*]

READINGS

COOPER, DAN H. *Administrative Planning for School Programs and Plants.* Chicago: University of Chicago Press, 1947. vi+160 pp. (Proceedings of the Sixteenth Annual Conference for Administrative Officers of Public and Private Schools).

This volume comprises the proceedings of the Sixteenth Annual University of Chicago Conference for Administrative Officers of Public and Private Schools, held in July, 1947. It continues the series previously edited by William C. Reavis.

The entire conference was devoted to school-plant problems. Quite appropriately, it began with a consideration of the characteristics of a modern educational program. The first two chapters deal with education for youth and education for adults, respectively. Education is conceived by these authors to be "a year-round whole-community enterprise" which goes far beyond the usual school curriculum for children and the traditional adult educational program. Implications for school plant are indicated at appropriate points. Anyone who wishes to plan wisely a school building for the future must delve deeply into considerations such as these.

Two chapters are devoted to school and community relationships, including the often neglected topic of the co-ordination of school planning with city- or community-wide planning.

The remaining chapters deal with surveys, financial and public-relations aspects, architectural planning in terms of educational needs, site development, interior decoration, and lighting, including a summary of the proposed new School Lighting Committee standards now before the American Standards Association for approval.

JOHN H. HERRICK

DIMOCK, MARSHALL E., AND DIMOCK, GLADYS O. *American Government in Action.* New York: Rinehart and Company, 1946. xii+946 pp.

This is one of the few political-science textbooks written in collaboration by husband and wife. It has avoided one of the pitfalls common to books written by a joint authorship: there is no evident break between the portions contributed by each author. This may be due, in part, to the fact that the book, in undertaking "to combine the elements of American government with an introduction to political science," has undertaken such a huge task that the entire work is somewhat jumpy as it moves from Chapter I through Chapter LIII.

The fifty-three chapters are grouped in twelve parts, beginning with "The Development of Statecraft" and concluding with "Government and Social Welfare." In the development of each topic, particular effort has been made to deal with government as it functions rather than with it as a group of agencies. Thus in the section devoted to "Constitutional Foundations," the problem of fundamental law, from the national level to municipal charters, is discussed. The problems of taxation and expenditures, similarly, are considered in their totality.

The authors have followed, generally, an orthodox division of their material. There are, however, a few exceptions. The discussion of civil liberties is largely omitted from the portion of the text devoted to the Constitution and taken up in the section devoted to "Law and the Judicial Establishment." More startling is the consideration of budget-making as a part of "Public Administration—the Law in Action," some twenty chapters after the discussion of public finance.

For the beginning student, these unusual aspects of organization will arouse neither doubt nor criticism. Such, however, will not be the case in the early chapters of the book, wherein the Dimocks undertake to telescope world political development and political philosophy into thirty pages. The "principles," "laws," and "hypotheses" formulated in this material create greater confusion than enlightenment. The failure to establish a factual background for many of the general principles laid down weakens the impact of the material throughout the book.

American Government in Action, despite its weaknesses, fills a real need. It breaks gently with the traditional structural approach. Those who demand more than political anatomy but hesitate to completely repudiate the orthodox division of material will welcome this text.

DAYTON E. HECKMAN

JOHNSON, F. ERNEST, editor. *Foundations of Democracy*. New York: Harper and Brothers, 1947. ix+278 pp. (Published by the Institute for Religious and Social Studies).

This volume consists of a series of seventeen lectures delivered before the Institute for Religious and Social Studies of the Jewish Theological Seminary of America. Especially rewarding are those studies dealing with the philosophical, religious, and political origins of democratic thought, as revealed in Greek, Roman, Hebraic, mediæval, and modern literary sources. The chapters relating to contemporary problems of democratic living are neither highly original nor constructive. With few exceptions, the discussions are free from obvious ideological bias and are objective in tone. A wide variety of viewpoints is represented.

RALPH M. STOGDILL

THOMPSON, ELEANOR WOLF. *Education for Ladies, 1830–1860*. New York: King's Crown Press, 1947. ix+170 pp.

Much of the material in this book is taken from the women's magazines of the years covered. Any impression that fashion was the major concern of *Godey's Lady's Book* is dispelled by this discussion of the attention given therein to promoting the education of women. The part played by women's magazines in the establishment of public schools, public high schools for girls, and public normal schools, is emphasized. Their awareness of our many current educational problems is evident in the articles they published on teacher training, salaries, education of the handicapped, "infant schools," and parent education. Mrs. Sarah Josepha Hale, "editress" of *Godey's Lady's Book*, was awarded a medal in 1860 by the Baltimore Female College for her "distinguished service in the cause of education" (page 132).

In conclusion, the author suggests that the medium of radio may today accomplish what the women's magazines of a century ago set out to do: "As

the ladies' magazines of a century ago reached a newly discovered audience and unleashed an unexpected force of public opinion, it is quite possible that radio's discovery of the listening hours of the woman on the farm and of the housewife and mother, may again bring the problems of education into the home" (page 139).

A great deal of research has gone into this little book and it should make a usable reference for material on the influence of women on the education of that era.

CHRISTINE Y. CONAWAY

HIGINBOTHAM, WILLIAM A., AND LINDLEY, ERNEST K. *Atomic Challenge.* New York: Foreign Policy Association, 1947. 63 pp. (Headline Series, No. 63).

This brochure is divided into two parts: *Splitting the Atom,* by William A. Higinbotham, a physicist; and *Harnessing the Atom,* by Ernest K. Lindley, a journalist and political reporter.

In order to give an impression of the possibilities and limitations of atomic energy, the author of the first part outlines the basic ideas of atomic physics from the time of John Dalton to the present. The presentation is adapted to the needs of intelligent laymen. Supplementary diagrams bring out vividly some of the salient facts. There is sufficient discussion of the relation of mass to energy to indicate the possibility of utilizing nuclear energy. The methods by which this was accomplished are outlined, and this part of the brochure concludes with the generally accepted statement that there is no defense against the atomic bomb.

In the second part, there is a lucid and, for the most part, chronological statement of the conditions under which the atomic bomb was developed and the decisions necessary for the control and utilization of atomic energy. Many suggestions for the solution of the appalling problems associated with the use of atomic bombs in warfare are discussed. The impasse in which we now find ourselves is outlined, with a consideration of the alternatives which confront us.

The Atomic Challenge deals with the most important scientific, social, political, and economic problem of our times. The utilization of atomic energy for government, industry, medicine, education, and national defense is a challenge which must not be escaped. These authors have presented the informed layman with a simple and unbiased discussion, extremely valuable for both understanding and action.

ALPHEUS W. SMITH

CROW, LESTER D., AND CROW, ALICE. *Our Teen-Age Boys and Girls.* New York: McGraw-Hill Book Company, Inc., 1945. xi+366 pp.

Lester and Alice Crow discuss the problems and the means of adjustment of adolescents in domestic, social, vocational, and school areas. A chapter is devoted to each of these phases of teen-age living. The chapters all follow this same pattern of development: a discussion of the various problems teen-age youth encounter in a particular area, the inclusion of appropriate case histories in this specific area, and a questionnaire for teachers and parents to check with reference to their own personal handling of boys' and girls' problems in the area. The authors not only have presented some potent factors producing teen-age disturbances but also have tried "to set up basic principles

for the guidance of adolescent boys and girls toward desirable behavior controls" (page 3).

The authors have a chapter devoted to a summarization of opinions upon juvenile delinquency. In this chapter they summarize their reactions to the collected excerpts with this question: Have we adults the right "to set up a code of ethics for our children because this code will be of value to them and to society in the future, and [yet] at the same time to direct our own behavior in terms of individual satisfactions and interests rather than according to group ideals?" (page 5). That is, teen-agers see this conflict in our culture: "Do as I say, not as I do" (page 357). The authors try to resolve this conflict by suggesting ways of checking unwholesome attitudes and behavior and of preserving desirable habit patterns, as well as the means of curing observable conflicts.

The book was written to be read by parents and those who are not familiar with the language or the theory of counseling and guidance. The presentation permits undergraduates and parents to comprehend how maladjustments arise and how these factors operate within consequent teen-age experiences. Many of the difficulties arise because adults lack understanding of the development of young people: "There is a normal development of many different types of adolescence having a wide range of experiences to be met and solved."

MILDRED C. SCHMIDT

BRAMELD, THEODORE. *Minority Problems in the Public Schools.* New York: Harper and Brothers, 1946. ix+264 pp.

The primary aim of this study by Mr. Brameld and the Bureau for Intercultural Education was to secure a broad overview of administrative practices and policies in various public-school systems which would demonstrate intercultural education to be both feasible and practical.

The cities in the study range in population from approximately thirty-five thousand to over two million, and represent, to some degree, cultural America. Unfortunately, no city in the deep South has been included in the study. The reason given for this omission is that it "was finally decided to concentrate upon cities in the northern half of the United States where patterns of segregation might be expected to be less static" (page 249).

Methods used in the study were conferences with many educators regarding plans for such a study, techniques to be used, and suggestions regarding schools to be visited and studied. The plans for actual visitation of the schools included an initial contact and conference, gathering some information by the questionnaire method, actual interviews, and school visits. The result of this work—actual descriptions of each community studied, its school administrative structure, some curricular practices, and administrative policies, along with their significance for intercultural relations—is presented early in the book with some evaluation and some specific recommendations.

In this book, Mr. Brameld has given us a splendid overview of a significant problem which has been long overdue. Its importance to professional education is obvious. It would appear not to be an overstatement to assert that he has accomplished his task with penetrating insight and tact. Here, indeed, is a frank appraisal or a status report of a real challenge to education, as well as some evidence of hope for those who care for the ways of democracy.

KENNETH ARISMAN

MacIver, R. M., editor. *Unity and Difference in American Life.* New York: Harper and Brothers, 1947. 168 pp. (Published by the Institute for Religious and Social Studies).

This little volume is the third in a series of addresses on group relations sponsored by the Institute for Religious and Social Studies of the Jewish Theological Seminary of America. Its purpose, in the words of the editor, is a consideration "of the relation between the multitude of groups among us and the unity of America, the national unity as it is affected by our group differences and our group divisions." The essays are arranged around three topical divisions: Part One is composed of three essays which trace the rise and development of American culture, with emphasis on the fact that in contrast "to the older belief in the equality of opportunity" we must and "are now beginning to assert the urgent need of recognizing the equality of human needs as basic to the conservation of individual personalities." In Part Two, four dividing issues are discussed: the racial, the ethnic, the economic, and the religious. Part Three is given over to discussions of what can be done by schools, press, business, courts, and "all."

The interested lay reader will find much food for thought in this book. The professional student of such issues will find it useful to have familiar material brought together in one volume.

Florence Greenhoe Robbins

Mulhern, James. *A History of Education.* New York: Ronald Press Company, 1946. xii+647 pp.

This textbook, intended for undergraduate students of education, is the outgrowth of a course which the author has given at the University of Pennsylvania for twenty years.

> It is not a history of education as it used to be presented, and, perhaps, as it is still presented in some schools. It is not a history of pedagogical theory and practice isolated from their social setting. Rather it is, in broad outline, the story of education in its relation to evolving society. Throughout, the emphasis is placed upon social thought, social institutions, and their evolutions, as conditioning educational thought, educational practice, and educational change (page iii).

This paragraph constitutes an admirable statement of what a history of education ought to be.

The book is divided into four parts, bearing the following titles: "Society and Education in the Pre-Renaissance World," "Social and Educational Change from the Renaissance to the French Revolution," "Social and Educational Change from the French Revolution until Recent Times," and "The Dawn of the New Social and Educational Era." Part I covers pre-literate and Oriental peoples. "Since all Oriental civilizations are essentially alike, we shall examine only two of them, that of Egypt and that of India" (page 60). Parts II and III deal with western Europe and the United States in the periods indicated by the titles, and Part IV with these regions in the twentieth century. In each of the last three parts, a description of the social and intellectual developments of the whole period is followed by a discussion of developments in educational theory and practice.

The book reflects the wide reading the author has done and is notable for the wealth of background material which he has presented and documented

from standard secondary accounts in English. In view of the range of material, there are comparatively few errors. The judgments and generalizations are generally in agreement with those of most present-day scholars. Hence, this will be a useful reference work for one who has some knowledge of the subject.

It will not, however, be a good textbook for beginners, because of the difficulty it presents to the reader. This is due in part to the organization of the treatment. Part II, for example, covers the long and complex period from the Renaissance to the French Revolution. Social and intellectual changes—humanism, economic developments, the Protestant and Catholic reformations, the beginning of modern science and philosophy, and others—are described in a chapter of about thirty pages that contains little or no reference to educational change. The following chapter covers, first, educational theory, and, next, educational practice. This separation in space between the accounts of social change and educational developments serves poorly the author's purpose of dealing with educational change "in its relation to evolving society."

The suitability of the book as a text is further impaired by the author's inability to organize the treatment of a major topic so as to present a clear flow of ideas—a beginning, a middle, and an end. The materials, very good in themselves, are not handled effectively. There is a complete lack of graphic materials—graphs, drawings, or photographs. There are very good lists of questions for further study in connection with each chapter, and carefully selected bibliographies.

R. H. ECKELBERRY

* * *

College Chemistry Students Deficient In Arithmetic: Academic Data

[*Continued from page 10*]

remedial instruction they were examined again using a test of similar problems. The added skill in arithmetic which some of these students acquired during training made it possible for them to receive scores in the upper two-thirds of the test distribution. The average score on the second test was 65.6.

Intercorrelations between six measures believed to be of value in predicting marks in college chemistry and the students' marks in chemistry are given in Table I. As was mentioned in an earlier paragraph, the criterion of success for this group of students was the final chemistry mark. The percentile scores on the Ohio State Psychological Examination correlate .54 with the chemistry mark and .59 with the total point-hour ratio for the same quarter.

The original Arithmetic Placement Test was not a good predictor for the members of the low-scoring group who took remedial instruction. The correlation between the final chemistry mark and the original arithmetic test was .16. However,

after remedial help, the scores on the second form of the Arithmetic Placement Test correlated .52 with the chemistry mark. The low correlation of .16 can be explained on the basis of the restricted range of scores. Our remedial group was chosen from the persons scoring in the lowest third on the arithmetic placement test. After three weeks' study they were tested again on the same kind of problems, and their scores on the arithmetic retest with the chemistry mark correlated .52. The remedial arithmetic training might not have been the cause of this apparent relationship, but it did take individuals from the lowest third of the distribution and redistribute them over the entire range of marks. Hence, the second test was a better predictor of success in chemistry than the first arithmetic placement test.

[Vol. XXVII, No. 1]

A Formula for Predicting Readability

[*Continued from page 20*]

level of the material. But if these words are in the common vocabulary of the farmer, they may not offer any special difficulty in comprehension. This factor, therefore, must be taken into account in dealing with materials having a specialized vocabulary. Thus the direction, "Hand me that Stillson," is perfectly clear to any mechanic but not very meaningful to the layman.

Keeping these cautions in mind, we have found that this formula can be a useful tool in selecting and preparing reading materials that can be understood by specified audiences.

[Vol. XXVII, No. 1]

A Promising Project

[*Continued from page 21*]

As Commissioner Studebaker said, it will try to "accelerate the rate at which good ideas can be spread among the nation's high schools." "Our job," said another member of the Commission, "will be to send out some challenge to the schools, to alert them on the need of modernizing their curriculums, and to give national support to curriculum revisions which are going on on a state and local level."

The Commission has a challenging task, and seems to be getting off to a good start. The project is highly promising.

R. H. E.